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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO. <i>mk</i>
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EXAMINER
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ART UNIT	PAPER NUMBER <i>5</i>
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DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/551,051

Applicant(s)

Basak et al.

Examiner

Callie Shosho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jun 8, 2001
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some\* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 20) ☐ Other

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**DETAILED ACTION**

1. All outstanding rejections except for those described below are overcome by applicants' amendment filed 6/8/01.

The following rejection is non-final, however, in light of the use of new references against the present claims, namely, Hiraoka et al. (U.S. 5,980,623), Malhotra et al. (U.S. 5,709,737), and Fuller et al. (U.S. 5,017,644).

**Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 13 is rejected under 35 U.S.C. 102(a) as being anticipated by Hiraoka et al. (U.S. 5,980,623).

Example 9 of Hiraoka et al. discloses an ink jet ink which has surface tension of 37 mN/m, conductivity of 4200  $\mu$ S/cm, and particle size of less than 450 nm.

In light of the above, it is clear that Hiraoka et al. anticipates the present claims.

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4. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by either Fuller et al. (U.S. 5,017,644) or Malhotra et al. (U.S. 5,709,737).

Fuller et al. disclose an ink jet ink which has surface tension of 40-50 dyne/cm which is equivalent to 40-50 mN/m, conductivity of 0.0075-0.009 mho/cm which is equivalent to 7500-9000  $\mu$ S/cm, and particle size less than 220 nm (col.6, lines 41-42 and 49-50 and example XIII).

Alternatively, Malhotra et al. disclose ink jet ink which has conductivity of 3640-6330  $\mu$ S/cm, surface tension of 38.3-41.7 dyne/cm which is equivalent to 38.3-41.7 mN/m, and particle size less than 450 nm (example VII and col.42, lines 29-30).

In light of the above, it is clear that either Fuller et al. or Malhotra et al. anticipates the present claim.

**Claim Rejections - 35 USC § 103**

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimatsu et al. (U.S. 5,913,971) in view of either Anton et al. (U.S. 6,005,023) or Ma et al. (U.S. 5,085,698), Tsutsumi et al. (U.S. 5,852,074), Sano et al. (U.S. 5,324,349), and either Lin et al. (U.S. 5,531,818) or Nigam et al. (U.S. 5,693,127).

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The rejection is adequately set forth in paragraph 5 of the office action mailed 12/8/00, Paper No. 5, and is incorporated here by reference.

7. Claims 1-10, 13-14, 17-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (U.S. 5,658,376) in view of either Anton et al. (U.S. 6,005,023) or Ma et al. (U.S. 5,085,698), Tsutsumi et al. (U.S. 5,852,074), Sano et al. (U.S. 5,324,349), and either Lin et al. (U.S. 5,531,818) or Nigam et al. (U.S. 5,693,127).

The rejection is adequately set forth in paragraph 6 of the office action mailed 12/8/00, Paper No. 5, and is incorporated here by reference.

8. Claims 1-5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sano et al. (U.S. 5,243,349) in view of either Anton et al. (U.S. 6,005,023) or Ma et al. (U.S. 5,085,698), and Tsutsumi et al. (U.S. 5,852,074).

The rejection is adequately set forth in paragraph 7 of the office action mailed 12/8/00, Paper No. 5, and is incorporated here by reference.

#### **Response to arguments**

9. Applicants' arguments filed 6/8/01 have been fully considered but they are not persuasive.

Specifically, applicants argue that:

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(a) The presently claimed ink is different from that of Fujimatsu et al. in that the amounts of ingredients required and their specific role.

(b) Fujimatsu et al., Anton et al., and Ma et al. disclose completely neutralized dispersant while in the present invention, the dispersant is not completely neutralized.

(c) None of the cited references utilize ammonium hydroxide.

(d) There is no disclosure in Fujimatsu et al., Noguchi et al., or Sano et al. of combination of anti-foaming agent and acrylic emulsion.

(e) Although Lin et al. and Nigam et al. disclose conductivities suitable for ink jet inks, applicant has recited specific conductivity ranges and means for optimizing the range.

(f) Noguchi et al. disclose different dispersant than presently claimed.

With respect to argument (a), it is noted that Fujimatsu et al. disclose an ink comprising 1-5% carbon black, 0.5-10% neutralized styrene/acrylic dispersant, 50-95% water, and 1-30% ethanol which clearly overlaps the presently claimed amounts of 1-12% pigment, 2-20% dispersant, and 30-90% water-ethanol. Fujimatsu et al. do not explicitly disclose the amount of anti-foaming agent utilized which is why Fujimatsu et al. is used in combination with Tsutsumi et al. which teaches using 0.005-5% anti-foaming agent in ink jet inks, Tsutsumi et al. also disclose that if the amount is too small, it is difficult to remove the small bubbles which form in the ink, while if the amount is too large, cissing occurs in the ink which degrades print quality. Further, given that Fujimatsu et al. in view of Tsutsumi et al. disclose amounts of pigment,

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dispersant, vehicle, and anti-foaming agent as presently claimed, it is clear that these ingredients would therefore intrinsically perform the same role in the ink as the ingredients presently claimed.

Thus, it is the examiner's position that Fujimatsu et al. in combination with Tsutsumi et al. clearly meets the claimed amounts of pigment, dispersant, vehicle, and anti-foaming agent as presently claimed.

With respect to argument (b), it is noted that there is no requirement in the claims regarding the degree of neutralization of the dispersant and thus, the claims are open to all degrees of neutralization including complete and partial. Furthermore, it is noted that it is not clear how applicants have determined that the dispersants of the prior art are completely neutralized. Clarification is requested.

With respect to argument (c), it is agreed that neither Fujimatsu et al., Noguchi et al., or Sano et al. disclose neutralizing dispersant with ammonium hydroxide. Rather, Fujimatsu et al., Noguchi et al., and Sano et al. neutralize their dispersants with morpholine or dimethylethanolamine, diethanolamine, and triethylamine, respectively, which is why each of the references is used in combination with either Anton et al. or Ma et al. which each disclose the equivalence and interchangeability of the neutralizing agents disclosed by either Fujimatsu et al., Noguchi et al., or Sano et al. with ammonium hydroxide.

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Applicants also argue that Anton et al. and Ma et al. disclose carrier medium different than that presently claimed, however, the water-polyhydric alcohol carrier medium disclosed by either Anton et al. or Ma et al. is just one preferred embodiment. Col.8, lines 51-60 of Ma et al. disclose the use of water and ethanol, while col.2, lines 15-16 of Anton et al. refer to Ma et al. for solvents suitable for use in the ink, and thus also discloses the use of water-ethanol.

Thus, in light of the disclosure of either Anton et al. or Ma et al., and absent clear and convincing evidence of criticality regarding the use of ammonium hydroxide as compared to the neutralizing agents of Fujimatsu et al., Noguchi et al., and Sano et al., it therefore would have been obvious to one of ordinary skill in the art to use ammonium hydroxide in either Fujimatsu et al., Noguchi et al., or Sano et al., and thereby arrive at the claimed invention.

Additionally, applicants argue that by using ammonium hydroxide in the present invention, a stable ink is formed which does not require any heating for dispersion stabilization at neutral conditions. However, it is noted that there is no requirement in the claims regarding stability or heating. Furthermore, even if there were such limitations present, it is the examiner's position that the combination of either Fujimatsu et al., Noguchi et al., or Sano et al. with either Anton et al. or Ma et al. would produce a dispersant which would intrinsically meet such limitations.



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With respect to argument (d), applicants argue that the combination of anti-foaming agent with acrylic emulsion enhances optical density and balances pH and conductivity. However, applicants have not provided clear and convincing evidence to support this position.

While it is agreed that neither Fujimatsu et al., Noguchi et al., or Sano et al. disclose combination of anti-foaming agent with acrylic emulsion, this is why each of the references is used in combination with a reference which either teaches the use of an acrylic emulsion, i.e. Fujimatsu et al. in view of Sano et al., an anti-foaming agent, i.e. Sano et al. in view of Tsutsumi et al., or both, i.e. Noguchi et al. in view of Sano et al. and Tsutsumi et al. Sano et al. teaches that the use of acrylic emulsion in ink jet inks increases optical density, while Tsutsumi et al. teaches that anti-foaming agent is used to prevent the formation of small bubbles in the ink as well of cissing of the ink.

In light of the above and given that all the combined references are drawn from the same field of endeavor and provide motivation for their combination, it is the examiner's position that, absent evidence of criticality, it therefore would have been obvious to one of ordinary skill in the art to utilize acrylic emulsion in Fujimatsu et al., anti-foaming agent in Sano et al., and acrylic emulsion and anti-foaming agent in Noguchi et al., and thereby arrive at the claimed invention.

With respect to argument (e), it is the examiner's position that in light of the teaching of either Lin et al. or Nigam et al. of conductivities typically possessed by ink jet inks, it would have been within the skill level of one of ordinary skill in the art to control the conductivities of the

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inks of Fujimatsu et al., Noguchi et al., or Sano et al. to values, including those presently claimed, in order to produce an ink which has sufficient conductivity for ink jet printing.

With respect to argument (f), applicants argue that Noguchi et al. uses bulk media for pigment dispersion, while the present invention uses species distribution of the dispersant in-situ for pigment dispersant. However, the present claims only require a dispersant not how or why the dispersant functions.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie Shosho whose telephone number is (703) 305-0208. The examiner can normally be reached on Mondays-Thursdays from 7:00 am to 4:30 am. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Callie Shosho

8/17/01

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